Claims:

1. A photosensitive polysilazane composition comprising a polysilazane or its modification product and a photoacid generator, wherein said polysilazane or its modification product is

a polysiloxazane having a number-average molecular weight of between 300 to 100,000 that contains, as its main repeating unit,

$-(RSi(NR^6)_{1.5})-$,$-(RSi(NR^6)O_{0.5})-$, $-(RSi(NR^6)_{0.5}O)-$, $-(RSiO_{1.5})-$ or $-(SiO_2)-$,

wherein R and R^6 respectively and independently represent a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, and alkylamino group or an alkylsilyl group, or

a polysilazane having a number-average molecular weight of between 100 to 100,000, that mainly contains the skeleton represented with the following general formula (II),

$$——(SiR^4(NR^5)_{1.5})_n——\qquad (II)$$

wherein R^4 and R^5 respectively and independently represent a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, a group other than these groups in which the portion bonded directly to the silicon or nitrogen is carbon, an alkylsilyl group, alkylamino group or an alkoxy group, and n is an arbitrary integer, and wherein

said photoacid generator is at least one type of compound selected from the group consisting of a peroxide and a nitrobenzyl ester.

2. The photosensitive polysilazane composition according to claim 1 wherein said polysilazane is a polysilazane having a number average molecular weight of 100 to 100,000 that mainly contains the skeleton represented by general formula (II).

3. The photosensitive polysilazane composition according to claim 2 wherein in general formula (II), R^4 is a methyl group or phenyl group, and R^5 is a hydrogen atom.

4. The photosensitive polysilazane composition according to claim 1 wherein said polysilazane is a polysiloxazane having a number average molecular weight of 300 to 100,000 that contains, as its main repeating unit, $-(RSi(NR^6)_{1.5})-$,$-(RSi(NR^6)O_{0.5})-$, $-(RSi(NR^6)_{0.5}O)-$, $-(RSiO_{1.5})-$ or $-(SiO_2)-$, wherein R and R^6 respectively and independently represent a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, an alkylamino group or an alkylsilyl group.

5. The photosensitive polysilazane composition according to claim 1 wherein said photoacid generator is a peroxide.

6. The photosensitive polysilazane composition according to claim 5 wherein said peroxide is selected from t-butyl peroxybenzoate, 3,3',4,4'-tetra(t-butylperoxycarbonyl)benzophenone or a,a'-bis(t-butylperoxy)diisopropylbenzene.

7. The photosensitive polysilazane composition according to claim 1 that further contains a sensitizing dye.

8. The photosensitive polysilazane composition according to claim 7 wherein said sensitizing dye is selected from coumarin, ketocoumarin and their derivatives and thiopyrylium salts.

9. The photosensitive polysilazane composition according to claim 1 that further contains an oxidation catalyst.

10. The photosensitive polysilazane composition according to claim 9 wherein said oxidation catalyst is palladium propionate.

11. A method of forming a patterned insulating film comprising: a step in which a coated film is formed of a photosensitive polysilazane composition comprising a polysilazane or its modification product and a photoacid generator, a step in which said coated film is exposed to light in a pattern, a step in which the exposed portion of said coated film is dissolved off, and a step in which the patterned polysilazane film formed as a result of said dissolving off is allowed to stand in an ambient atmosphere or baked to convert it to a silica-based ceramic coating, wherein said polysilazane or its modification is

a polysiloxazane having a number-average molecular weight of between 300 to 100,000 that contains, as its main repeating unit,

$-(RSi(NR^6)_{1.5})-$,$-(RSi(NR^6)O_{0.5})-$, $-(RSi(NR^6)_{0.5}O)-$, $-(RSiO_{1.5})-$ or $-(SiO_2)-$, wherein R and R^6 respectively and independently represent a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, and alkylamino group or an alkylsilyl group, or

a polysilazane having a number-average molecular weight of between 100 to 100,000, that mainly contains the skeleton represented with the following general formula (II),

$$——(SiR^4(NR^5)_{1.5})_n——\qquad (II)$$

wherein R^4 and R^5 respectively and independently represent a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, a group other than these groups in which the portion bonded directly to the silicon or nitrogen is carbon, an alkylsilyl group, alkylamino group or an alkoxy group, and n is an arbitrary integer, and wherein

said photoacid generator is at least one type of compound selected from the group consisting of a peroxide and a nitrobenzyl ester.

12. The method according to claim 11, wherein said polysilazane is a polysilazane having a number average molecular weight of 100 to 100,000 that mainly contains the skeleton represented by general formula (II).

13. The method according to claim 12, wherein in general formula (II), R^4 is a methyl group or phenyl group, and R^5 is a hydrogen atom.

14. The method according to claim 11, wherein said polysilazane is a polysiloxazane having a number-average molecular weight of between 300 to 100,000 that contains, as its main repeating unit, $-(RSi(NR^6)_{1.5})-$, $-(RSi(NR^6)O_{0.5})-$, $-(RSi(NR^6)_{0.5}O)-$, $-(RSiO_{1.5})-$ or $-(SiO_2)-$, wherein R and R^6 respectively and independently represent a hydrogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aryl group, and alkylamino group or an alkylsilyl group.

15. The method according to claim 11, wherein said peroxide is selected from t-butyl peroxybenzoate, 3,3',4,4'-tetra(t-butylperoxycarbonyl)benzophenone or a,a'-bis(t-butylperoxy)diisopropylbenzene.

16. The method according to claim 11, wherein said photosensitive polysilazane composition further contains a sensitizing dye.

17. The method according to claim 16, wherein said sensitizing dye is selected from coumarin, ketocoumarin and their derivatives and thiopyrylium salts.

18. The method according to claim 11, wherein said photosensitive polysilazane composition further contains an oxidation catalyst.

19. The method according to claim 18, wherein said oxidation catalyst is palladium propionate.